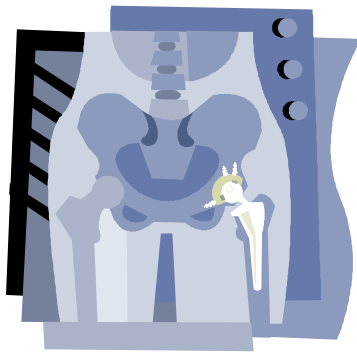


Novel TiB Surface Hardening

U N I V E R S I T Y O F U T A H

CENTER

Now in its second year, this Center is commercializing a variety of materials that use boron to harden and otherwise improve the performance of titanium under applications with a lot of wear. The unique advantages of the TiB surface hardening technology include



a stable surface layer, hardness and wear resistance coupled with electrical conductivity ideal for applications such as biomedical implants (i.e. hip/knee replacements), bearings and cutting tools. The nanostructured bulk titanium boride and the functionally graded titanium boride are novel material technologies for innovative applications such as armor, gun barrels and die inserts.

TECHNOLOGY

The Center technology involves the (i) incorporation of titanium monoboride (TiB) crystals to harden the surfaces of titanium, (ii) creation of nanostructured titanium boride bulk material and (iii) functionally graded titanium boride materials for high performance components and devices. These materials also have significant advantages over existing materials in the market in terms of manufacturability and low cost. Applications include titanium biomedical devices, bearings for aerospace, industrial and sports applications, armor and gun barrel applications.

ACCOMPLISHMENTS

A key accomplishment in 2004-05 is the creation of a new type of titanium boride material, nanostructured Titanium Boride Systems and the associated patent filing. The nanostructured titanium boride material is a novel, very high strength material that has higher reliability and lower cost of manufacturing compared to most conventional ceramics. Possible applications include armor and dies and inserts. Utah-based Ortho Development Corporation, continues to be a major supporter and beneficiary of the Center's work, targeting the development and FDA validation of orthopedic implants using the TiB coating - offering for the first time the potential for implants that last a lifetime, even with young recipients. In addition, the Center is pursuing commercial partnerships in the other fields of use, with very exciting potential partnerships developing.

THINK TANK

What if there was...

A way to make
lightweight
titanium boride
body armor to
protect police,
troops and security
forces? What if the
same material
could double the
life of a hip, knee
or spine
replacement joint?



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